## EXERCISE 18(A)

**1. Express each of the following statements in algebraic form:**
**(i) The sum of 8 and x is equal to y.**
**(ii) x decreased by 5 is equal to y.**
**(iii) The sum of 2 and x is greater than y.**
**(iv) The sum of x and y is less than 24.**
**(v) 15 multiplied by m gives 3n.**
**(vi) Product of 8 and y is equal to 3x.**
**(vii) 30 divided by b is equal to p.**
**(viii) z decreased by 3x is equal to y.**
**(ix) 12 times of x is equal to 5z.**
**(x) 12 times of x is greater than 5z.**
**(xi) 12 times of x is less than 5z.**
**(xii) 3z subtracted from 45 is equal to y.**
**(xiii) 8x divided by y is equal to 2z.**
**(xiv) 7y subtracted from 5x gives 8z.**
**(xv) 7y decreased by 5x gives 8z.**
**Solution:**
(i) The sum of 8 and x is equal to y in algebraic form is written as,
$8 + x = y$
(ii) x decreased by 5 is equal to y in algebraic form is written as,
$x - 5 = y$
(iii) The sum of 2 and x is greater than y in algebraic form is written as,
$2 + x > y$
(iv) The sum of x and y is less than 24 in algebraic form is written as,
$x + y < 24$
(v) 15 multiplied by m gives 3n in algebraic form is written as,
$15 \times m = 3n$
(vi) Product of 8 and y is equal to 3x in algebraic form is written as,
$8 \times y = 3x$
(vii) 30 divided by b is equal to p in algebraic form is written as,
$30 \div b = p$
(viii) z decreased by 3x is equal to y in algebraic form is written as,
$z - 3x = y$
(ix) 12 times of x is equal to 5z in algebraic form is written as,
$12 \times x = 5z$
(x) 12 times of x is greater than 5z in algebraic form is written as,
$12 \times x > 5z$
(xi) 12 times of x is less than 5z in algebraic form is written as,

$12 \times x < 5z$
(xii) 3z subtracted from 45 is equal to y in algebraic form is written as,
$45 - 3z = y$
(xiii) 8x divided by y is equal to 2z in algebraic form is written as,
$8x \div y = 2z$
(xiv) 7y subtracted from 5x gives 8z in algebraic form is written as,
$5x - 7y = 8z$
(xv) 7y decreased by 5x gives 8z in algebraic form is written as,
$7y - 5x = 8z$

**2. For each of the following algebraic expressions, write a suitable statement in words:**
**(i) $3x + 8 = 15$**
**(ii) $7 - y > x$**
**(iii) $2y - x < 12$**
**(iv) $5 \div z = 5$**
**(v) $a + 2b > 18$**
**(vi) $2x - 3y = 16$**
**(vii) $3a - 4b > 14$**
**(viii) $b + 7a < 21$**
**(ix) $(16 + 2a) - x > 25$**
**(x) $(3x + 12) - y < 3a$**
**Solution:**
(i) The algebraic expression $3x + 8 = 15$ in words is expressed as,
3x plus 8 is equal to 15
(ii) The algebraic expression $7 - y > x$ in words is expressed as,
7 decreased by y is greater than x
(iii) The algebraic expression $2y - x < 12$ in words is expressed as,
2y decreased by x is less than 12
(iv) The algebraic expression $5 \div z = 5$ in words is expressed as,
5 divided by z is equal to 5
(v) The algebraic expression $a + 2b > 18$ in words is expressed as,
a increased by 2b is greater than 18
(vi) The algebraic expression $2x - 3y = 16$ in words is written as,
2x decreased by 3y is equal to 16
(vii) The algebraic expression $3a - 4b > 14$ in words is written as,
3a decreased by 4b is greater than 14
(viii) The algebraic expression $b + 7a < 21$ in words is written as,
b increased by 7a is less than 21

(ix) The algebraic expression $(16 + 2a) – x > 25$ in words is written as,
The sum of 16 and 2a decreased by x is greater than 25
(x) The algebraic expression $(3x + 12) – y < 3a$ in words is written as,
The sum of 3x and 12 decreased by y is less than 3a

## EXERCISE 18(B)

**1. Separate the constants and the variables from each of the following:**
**6, 4y, -3x, 5 / 4, (4 / 5)xy, az, 7p, 0, 9x / y, 3 / 4x, - xz / 3y**
**Solution:**
6, 5 / 4and 0 are the constants
4y, -3x, (4 / 5)xy, az, 7p, 9x / y, 3 / 4x and – xz / 3y are the variables

**2. Group the like terms together:**
**(i) 4x, -3y, -x, (2 / 3)x, (4 / 5)y and y.**
**(ii) (2 / 3) xy, -4yx, 2yz, (-2 / 3)yz, zy / 3 and yx.**
**(iii) $-ab^2$, $b^2a^2$, $7b^2a$, $-3a^2b^2$ and $2ab^2$**
**(iv) 5ax, -5by, by / 7, 7xa and 2ax / 3**
**Solution:**
(i) 4x, -3y, -x, (2 / 3)x, (4 / 5)y and y.
Here, the like term are as follows
4x, -x, (2 / 3)x and -3y, (4 / 5)y, y
(ii) (2 / 3) xy, -4yx, 2yz, (-2 / 3)yz, zy / 3 and yx.
Here, the like terms are as follows
(2 / 3) xy, -4yx, yx and 2yz, (-2 / 3)yz, zy / 3
(iii) $-ab^2$, $b^2a^2$, $7b^2a$, $-3a^2b^2$ and $2ab^2$
Here, the like terms are as follows
$-ab^2$, $7b^2a$, $2ab^2$ and $b^2a^2$, $-3a^2b^2$
(iv) 5ax, -5by, by / 7, 7xa and 2ax / 3
Here, the like terms are as follows
5ax, 7xa, 2ax / 3 and – 5by, by / 7

**3.State whether true or false:**
**(i) 16 is a constant and y is a variable but 16y is variable**
**(ii) 5x has two terms 5 and x**
**(iii) The expression 5 + x has two terms 5 and x**
**(iv) The expression $2x^2 + x$ is a trinomial**
**(v) $ax^2 + bx + c$ is a trinomial**
**(vi) 8 × ab is a binomial**
**(vii) 8 + ab is a binomial**
**(viii) $x^3 – 5xy + 6x + 7$ is a polynomial**
**(ix) $x^3 – 5xy + 6x + 7$ is a multinomial**
**(x) The coefficient of x in 5x is 5x**
**(xi) The coefficient of ab in –ab is -1**

**(xii) The coefficient of y in -3xy is -3**

**Solution:**

(i) 16 is a constant and y is a variable but 16y is variable

The given statement is **true**

(ii) 5x has two terms 5 and x

The given statement is **false**

(iii) The expression 5 + x has two terms 5 and x

The given statement is **true**

(iv) The expression $2x^2 + x$ is a trinomial

The given statement is **false**

(v) $ax^2 + bx + c$ is a trinomial

The given statement is **true**

(vi) 8 × ab is a binomial

The given statement is **false**

(vii) 8 + ab is a binomial

The given statement is **true**

(viii) $x^3 – 5xy + 6x + 7$ is a polynomial

The given statement is **true**

(ix) $x^3 – 5xy + 6x + 7$ is a multinomial

The given statement is **true**

(x) The coefficient of x in 5x is 5x

The given statement is **false**

(xi) The coefficient of ab in –ab is -1

The given statement is **true**

(xii) The coefficient of y in -3xy is -3

The given statement is **false**

**4. State the number of terms in each of the following expressions:**

**(i) 2a – b**

**(ii) 3 × x + a / 2**

**(iii) 3x – x / p**

**(iv) a ÷ x × b + c**

**(v) 3x ÷ 2 + y + 4**

**(vi) xy ÷ 2**

**(vii) x + y ÷ a**

**(viii) 2x + y + 8 ÷ y**

**(ix) 2 × a + 3 ÷ b + 4**

**Solution:**

(i) 2a – b

The number of terms in given expression is two
(ii) $3 \times x + a / 2$
The number of terms in given expression is two
(iii) $3x - x / p$
The number of terms in given expression is two
(iv) $a \div x \times b + c$
The number of terms in given expression is two
(v) $3x \div 2 + y + 4$
The number of terms in given expression is three
(vi) $xy \div 2$
The number of terms in given expression is two
(vii) $x + y \div a$
The number of terms in given expression is two
(viii) $2x + y + 8 \div y$
The number of terms in given expression is three
(ix) $2 \times a + 3 \div b + 4$
The number of terms in given expression is three

**5. State whether true or false:**
**(i) xy and –yx are like terms.**
**(ii) $x^2y$ and $–y^2x$ are like terms.**
**(iii) a and –a are like terms.**
**(iv) –ba and 2ab are unlike terms.**
**(v) 5 and 5x are like terms.**
**(vi) 3xy and 4xyz are unlike terms.**
**Solution:**
(i) xy and –yx are like terms
Yes, xy and –yx are like terms. Hence, the given statement is **true**
(ii) $x^2y$ and $–y^2x$ are like terms
No, $x^2y$ and $–y^2x$ are not like terms. Hence, the given statement is **false**
(iii) a and –a are like terms.
Yes, a and –a are like terms. Hence, the given statement is **true**
(iv) –ba and 2ab are unlike terms.
No, –ba and 2ab are like terms. Hence, the given statement is **false**
(v) 5 and 5x are like terms.
No, 5 and 5x are not like terms. Hence, the given statement is **false**
(vi) 3xy and 4xyz are unlike terms.
Yes, 3xy and 4xyz are unlike terms. Hence, the given statement is **true**

**6. For each expression, given below, state whether it is a monomial, or a binomial or a trinomial.**

**(i) xy**

**(ii) xy + x**

**(iii) 2x ÷ y**

**(iv) –a**

**(v) $ax^2 – x + 5$**

**(vi) -3bc + d**

**(vii) 1 + x + y**

**(viii) 1 + x ÷ y**

**(ix) $x + xy – y^2$**

**Solution:**

(i) xy

Here xy has one term

Therefore, xy is a **monomial**

(ii) xy + x

Here xy + x has two terms

Therefore, xy + x is a **binomial**

(iii) 2x ÷ y

Here 2x ÷ y has one term

Therefore, 2x ÷ y is **monomial**

(iv) –a

Here –a has one term

Therefore, –a is a **monomial**

(v) $ax^2 – x + 5$

Here $ax^2 – x + 5$ has three terms

Therefore, $ax^2 – x + 5$ is a **trinomial**

(vi) -3bc + d

Here -3bc + d has two terms

Therefore, -3bc + d is a **binomial**

(vii) 1 + x + y

Here 1 + x + y has three terms

Therefore, 1 + x + y is a **trinomial**

(viii) 1 + x ÷ y

Here 1 + x ÷ y has two terms

Therefore, 1 + x ÷ y is a **binomial**

(ix) $x + xy – y^2$

Here $x + xy – y^2$ has three terms

Therefore, $x + xy – y^2$ is a **trinomial**

**7. Write down the coefficient of x in the following monomial:**
**(i) x**
**(ii) –x**
**(iii) -3x**
**(iv) -5ax**
**(v) 3 / 2 xy**
**(vi) ax / y**
**Solution:**
(i) x
The coefficient of x in the given monomial x is 1
(ii) – x
The coefficient of x in the given monomial –x is -1
(iii) -3x
The coefficient of x in the given monomial -3x is -3
(iv) -5ax
The coefficient of x in the given monomial -5ax is -5a
(v) 3 / 2 xy
The coefficient of x in the given monomial is (3 / 2)y
(vi) ax / y
The coefficient of x in the given monomial is (a / y)

**8. Write the coefficient of:**
**(i) x in $-3xy^2$**
**(ii) x in –ax**
**(iii) y in –y**
**(iv) y in (2 / a)y**
**(v) xy in -2xyz**
**(vi) ax in $–axy^2$**
**(vii) $x^2y$ in $-3ax^2y$**
**(viii) $xy^2$ in $5axy^2$**
**Solution:**
(i) x in $-3xy^2$
- $3y^2$ is the coefficient of x in $-3xy^2$
(ii) x in –ax
- a is the coefficient of x in –ax
(iii) y in –y
-1 is the coefficient of y in –y
(iv) y in (2 / a)y
(2 / a) is the coefficient of y in (2 / a)y

(v) xy in -2xyz
- 2z is the coefficient of xy in -2xyz
(vi) ax in $–axy^2$
- $y^2$ is the coefficient of ax in $–axy^2$
(vii) $x^2y$ in $-3ax^2y$
- 3a is the coefficient of $x^2y$ in $-3ax^2y$
(viii) $xy^2$ in $5axy^2$
5a is the coefficient of $xy^2$ in $5axy^2$

**9. State the numeral coefficient of the following monomials:**
**(i) 5xy**
**(ii) abc**
**(iii) 5pqr**
**(iv) -2x / y**
**(v) (2 / 3) $xy^2$**
**(vi) -15xy / 2z**
**(vii) -7x ÷ y**
**(viii) -3x ÷ (2y)**
**Solution:**
(i) 5xy
The numeral coefficient of the given monomial is 5
(ii) abc
The numeral coefficient of the given monomial is 1
(iii) 5pqr
The numeral coefficient of the given monomial is 5
(iv) -2x / y
The numeral coefficient of the given monomial is -2
(v) (2 / 3) $xy^2$
The numeral coefficient of the given monomial is (2 / 3)
(vi) -15xy / 2z
The numeral coefficient of the given monomial is (-15 / 2)
(vii) -7x ÷ y
The numeral coefficient of the given monomial is -7 ÷ 1 = -7
(viii) -3x ÷ (2y)
The numeral coefficient of the given monomial is -3 ÷ 2 i.e. (-3 / 2)

**10. Write the degree of each of the following polynomials:**
**(i) $x + x^2$**
**(ii) $5x^2 – 7x + 2$**
**(iii) $x^3 – x^8 + x^{10}$**
**(iv) $1 – 100x^{20}$**
**(v) $4 + 4x – 4x^3$**
**(vi) $8x^2y – 3y^2 + x^2y^5$**
**(vii) $8z^3 – 8y^2z^3 + 7yz^5$**
**(viii) $4y^2 – 3x^3 + y^2x^7$**
**Solution:**
(i) $x + x^2$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $x + x^2$ is 2
(ii) $5x^2 – 7x + 2$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $5x^2 – 7x + 2$ is 2
(iii) $x^3 – x^8 + x^{10}$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $x^3 – x^8 + x^{10}$ is 10
(iv) $1 – 100x^{20}$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $1 – 100x^{20}$ is 20
(v) $4 + 4x – 4x^3$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $4 + 4x – 4x^3$ is 3
(vi) $8x^2y – 3y^2 + x^2y^5$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $8x^2y – 3y^2 + x^2y^5$ is 7
(vii) $8z^3 – 8y^2z^3 + 7yz^5$
The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial
Therefore, the degree of the given polynomial $8z^3 – 8y^2z^3 + 7yz^5$ is 6

(viii) $4y^2 – 3x^3 + y^2x^7$

The degree of the polynomial is the greatest of sums of degree of two or more variables of the given polynomial

Therefore, the degree of the given polynomial $4y^2 – 3x^3 + y^2x^7$ is 9